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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/916,211	07/25/2001	Russell Howard Barton	130109.407	6847

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EXAMINER

CREPEAU, JONATHAN

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 01/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/916,211

Applicant(s)

BARTON ET AL.

Examiner

Jonathan S. Crepeau

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 7,8,11-13,16-20,22,32,36-38 and 43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7,8,11-13,16-20,22,32 and 38 is/are allowed.
- 6) ☒ Claim(s) 36,37 and 43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action addresses claims 7, 8, 11-13, 18-20, 22, 32, 36-38, and 43, after entry of the amendment filed on December 30, 2004. Claims 7, 8, 11-13, 16-20, 22, 32, and 38 are allowed. Claims 36, 37, and 43 are newly rejected under 35 USC §103 herein. As such, finality of the last Office action is withdrawn and prosecution is reopened.

### ***Claim Rejections - 35 USC § 103***

2. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sawyer (U.S. Patent 6,569,549) in view of Reiser et al (U.S. Pre-Grant Publication No. 2002/0076583).

Sawyer is directed to a system and method for purging a fuel cell stack (see abstract). The fuel cell stack comprises a purge valve (30), an actuator for opening and closing the valve, and a controller (32) for controlling the actuators (see Fig. 3). The controller actuates the purge assembly upon the measurement of a process parameter (e.g., nitrogen concentration) reaching a purging condition value (see col. 8 line 50 et seq.). The fuel cell is purged with hydrogen in pulsed manner until the value of the measured parameter is reduced below a threshold value (see Fig. 7). The duration of the purge pulse is determined based on the current density of the fuel cell stack (see col. 7, line 51 et seq.). Further, the reference teaches that the purge valve is opened during startup of the fuel cell (see col. 8, line 23).

The reference does not expressly teach that the purge valve is also opened during a shutdown of the fuel cell stack, as recited in claim 36.

Reiser et al. is directed to a procedure for shutting down a fuel cell comprising the step of purging the anode with air.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to incorporate the air purging step of Reiser et al. into the method of Sawyer. In paragraph [0013], Reiser teaches that “one object of the present intention is to minimize any fuel cell catalyst and catalyst support corrosion occurring during shut-down of the fuel cell.” As such, the artisan would be motivated to incorporate the air purging step of Reiser et al. into the method of Sawyer, so as to purge residual hydrogen and nitrogen from the anode of Sawyer upon shutdown.

3. Claims 37 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawyer in view of Reiser et al. as applied to claim 36 above, and further in view of Strasser.

Sawyer does not expressly teach that a voltage is measured across a purge cell portion of the stack and the stack is purged accordingly, as recited in claims 37 and 43, or that the controller contains a computer-readable media containing instructions for causing a processor to control the fuel cell system, as recited in claim 43.

Strasser teaches a fuel cell system wherein the purging of the fuel cell is based on the voltage of a purge cell portion as compared with the average voltage of the fuel cell (see col. 5, line 10 et seq.).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to incorporate the voltage measurements of Strasser into the control scheme of Sawyer. As discussed in Sawyer, nitrogen accumulates throughout the anode flow field of the fuel cell and is measured at a point near the outlet of the system. Similarly, in column 5, line 10, Strasser teaches that “[i]n this process, inert-gas components accumulate in the last stage of the cascade, which for instance, consists of one cell, whereby the voltage of the last stage of the cascade drops.” Thus, it is seen that a voltage measurement of the purge cell of Sawyer would be analogous to a nitrogen concentration measurement, as the nitrogen concentration adversely affects the voltage. Accordingly, the artisan would be motivated to use the voltage measurements of Strasser in the system of Sawyer, as these measurements are easy to make with voltage sensors and produce a result which is a direct measure of the performance of the system.

Regarding the computer-readable media containing instructions for causing a processor to control the fuel cell system, as recited in claim 43, this subject matter would also be obvious to the skilled artisan. In column 2, line 17, Sawyer teaches that conventional PEM fuel cell assemblies contain “a microprocessor that controls the operation of the fuel cell power plant.” Such microprocessors are routinely controlled by instructions which reside in a computer-readable memory area of the controller, e.g., a read-only memory (ROM). Accordingly, the


artisan would be motivated to use such a configuration in the system of Sawyer to efficiently and precisely control the operation of the system.

### *Conclusion*

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jonathan Crepeau  
Primary Examiner  
Art Unit 1746  
January 12, 2005